AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for cryo-preserving ~~a biomaterial~~ cells, the method comprising:

a) exposing ~~a biomaterial~~ cells, each cell having a membrane and at least one transporter molecule capable of transporting a preservation agent across the membrane, to a preservation agent~~;~~ ;

b) the transporter molecule ~~being effective to transport~~ transporting the preservation agent across the membrane to load the ~~biomaterial~~ cells with the preservation agent to a ~~desire~~ desired concentration sufficient for preserving the ~~biomaterial~~ cells;

c) ~~b)~~ freezing ~~preparing~~ the preservation agent loaded ~~biomaterial~~ cells; ~~for storage in a preserved state~~

d) storing the preservation agent loaded cells in a frozen state.

2-7. (Canceled)

8. (Currently Amended) The method of ~~claim 5~~ claim 1, further comprising:

e) ~~d)~~ recovering at least a portion of the preservation agent loaded ~~biomaterial~~ cells in a viable state.

9. (Currently Amended) The method of claim 8, wherein the step of recovering includes removing the preservation agent from the ~~biomaterial~~ cells.

10. (Currently Amended) The method of claim 1, wherein the ~~biomaterial is~~ cells are selected from the group consisting of ~~organs, tissues, cells,~~ stem cells, cell-lines, bone marrow, embryos, platelets, fibroblasts, lymphocytes, hepatocytes, osteoblasts, spermatozoa, granulocytes, red blood cells, dendritic cells, oocytes, and plant cells.

11. (Currently Amended) The method of claim 1, wherein the ~~biomaterial includes~~ cells include mammalian cells.

12. (Currently Amended) The method of claim 11, wherein the ~~biomaterial includes~~ mammalian cells include hepatocytes.

13. (Currently Amended) The method of ~~claim 1~~ claim 11, wherein the transporter molecule is a selected from the group consisting of a glucose transporter protein (GLUT), a sucrose transporter protein, a mannose transporter protein, a galactose transporter protein, and a hexose transporter protein.

14. (Currently Amended) The method of ~~claim 1~~ claim 13, wherein the transporter molecule is a glucose transporter protein (GLUT).

15. (Currently Amended) The method of ~~claim 1~~ claim 14, wherein the ~~non-metabolizable~~ preservation agent is a non-metabolizable ~~carbohydrate~~ sugar.

16. (Original) The method of claim 15, wherein the non-metabolizable ~~carbohydrate~~ sugar is selected from the group consisting of 3-O-methyl-glucose (3OMG), 2-deoxy-glucose (2DG), 6-deoxy-glucose (6DG), methyl α-D-glucoside, methyl β-D-glucoside, 1,6-anhydro-β-D-glucose, and 1,5-anhydro-D-glucitol.

17. (Currently Amended) The method of claim 15, wherein the non-metabolizable ~~preservation agent~~ sugar is 3-O-methyl-glucose (3OMG).

18. (Canceled)

19. (Currently Amended) A method for preserving one or more mammalian cells, the method comprising:

a) exposing one or more mammalian cells having a membrane and at least one transporter protein to a non-metabolizable preservation agent;

b) ~~,~~the transporter protein ~~being effective to transport~~ transporting the non-metabolizable preservation agent across the membrane to load the mammalian cells with the

non-metabolizable preservation agent to a desired intracellular concentration sufficient for preserving the mammalian cells;

c) ~~b)~~ preparing the preservation agent loaded mammalian cells for storage in a preserved state;

d) ~~c)~~ storing the preservation agent loaded mammalian cells in a preserved state; and

e) ~~d)~~ recovering at least a portion of the preservation agent loaded mammalian cells to a viable state.

20. (Original) The method of claim 19, wherein the mammalian cells comprise nucleated mammalian cells.

21. (Original) The method of claim 19, wherein the mammalian cells include at least one selected from the group consisting of organ cells, tissue cells, stem cells, cell-lines, bone marrow cells, embryo cells, platelets, fibroblasts, lymphocytes, hepatocytes, osteoblasts, granulocytes, red blood cells, and dendritic cells.

22. (Original) The method of claim 19, wherein the mammalian cells comprise hepatocytes.

23. (Original) The method of claim 19, wherein the step of preparing the preservation agent loaded mammalian cells for storage in a preserved state includes at least one selected from the group consisting of freezing, drying, and freeze-drying.

24. (Canceled)

25. (Canceled)

26. (Original) The method of claim 19, wherein the transporter protein is a selected from the group consisting of a glucose transporter protein (GLUT), a sucrose transporter protein, a mannose transporter protein, a galactose transporter protein, and a hexose transporter protein.

27. (Original) The method of claim 19, wherein the transporter protein is a glucose transporter protein (GLUT).

28. (Currently Amended) The method of ~~claim 19~~ claim 26, wherein the non-metabolizable preservation agent is a non-metabolizable carbohydrate.

29. (Original) The method of claim 28, wherein the non-metabolizable carbohydrate is selected from the group consisting of 3-O-methyl-glucose (3OMG), 2-deoxy-glucose (2DG), 6-deoxy-glucose (6DG), methyl α-D-glucoside, methyl β-D-glucoside, 1,6-anhydro-β-D-glucose, and 1,5-anhydro-D-glucitol.

30. (Original) The method of claim 28, wherein the non-metabolizable preservation agent is 3-O-methyl-glucose (3OMG).

31. (Canceled)

32. (Original) The method of claim 19, wherein the desired intracellular concentration of non-metabolizable preservation agent is less than or equal to about 1.0 M.

33. (Original) The method of claim 19, wherein the desired intracellular concentration of non-metabolizable preservation agent is less than or equal to about 0.4 M.

34. (Original) The method of claim 19, wherein the desired intracellular concentration of non-metabolizable preservation agent is less than or equal to about 0.2 M.

35. (Original) The method of claim 19, wherein the mammalian cells are preserved in a frozen state.

36. (Canceled)

37. (Original) A method for preserving one or more nucleated mammalian cells, the method comprising:

a) exposing one or more nucleated mammalian cells having a membrane and at least one transporter protein to a preservation agent comprising a non-metabolizable carbohydrate, the transporter protein being effective to transport the non-metabolizable carbohydrate across the membrane to load the nucleated mammalian cells with the non-metabolizable carbohydrate to a desired intracellular concentration sufficient for preserving the mammalian cells;

b) preparing the preservation agent loaded nucleated mammalian cells for storage in a preserved state by a method selected from the group consisting of freezing, drying, and freeze-drying;

c) storing the preservation agent loaded nucleated mammalian cells in a preserved state, the preservation agent loaded nucleated mammalian cells being stored in a state selected from the group consisting of a dry state and a frozen state; and

d) recovering at least a portion of the preservation agent loaded mammalian cells to a viable state.

38. (Original) The method of claim 37, wherein the transporter protein is a selected from the group consisting of a glucose transporter protein (GLUT), a sucrose transporter protein, a mannose transporter protein, a galactose transporter protein, and a hexose transporter protein.

39. (Original) The method of claim 37, wherein the transporter protein is a glucose transporter protein (GLUT).

40. (Original) The method of claim 39, wherein the non-metabolizable carbohydrate is selected from the group consisting of 3-O-methyl-glucose (3OMG), 2-deoxy-glucose (2DG), 6-deoxy-glucose (6DG), methyl α-D-glucoside, methyl β-D-glucoside, 1,6-anhydro-β-D-glucose, and 1,5-anhydro-D-glucitol.

41. (Original) The method of claim 39, wherein the non-metabolizable carbohydrate is 3-O-methyl-glucose (3OMG).

42. (Canceled)

43. (Original) The method of claim 37, wherein the desired intracellular concentration of non-metabolizable carbohydrate is less than or equal to about 1.0 M.

44. (Original) The method of claim 37, wherein the desired intracellular concentration of non-metabolizable carbohydrate is less than or equal to about 0.4 M.

45. (Original) The method of claim 37, wherein the desired intracellular concentration of non-metabolizable carbohydrate is less than or equal to about 0.2 M.

46-57. (Canceled)

58. (New) A method for preserving one or more mammalian cells, the method comprising:

a) exposing one or more mammalian cells having a membrane and at least one transporter protein, the transporter protein being selected from the group consisting of a glucose transporter protein (GLUT), a sucrose transporter protein, a mannose transporter protein, a galactose transporter protein, and a hexose transporter protein, to a non-metabolizable sugar;

b) the transporter protein transporting the non-metabolizable sugar across the membrane to load the mammalian cells with the non-metabolizable sugar to a desired intracellular concentration sufficient for preserving the mammalian cells;

c) preparing the non-metabolizable sugar loaded mammalian cells for storage in a preserved state;

d) storing the preservation agent loaded mammalian cells in a preserved state; and

e) recovering at least a portion of the preservation agent loaded mammalian cells to a viable state.

59. (New) The method of claim 58, wherein the transporter protein is a glucose transporter protein (GLUT).

60. (New) The method of claim 58, wherein the non-metabolizable sugar is selected from the group consisting of 3-O-methyl-glucose (3OMG), 2-deoxy-glucose (2DG), 6-deoxy-glucose

(6DG), methyl α-D-glucoside, methyl β-D-glucoside, 1,6-anhydro-β-D-glucose, and 1,5-anhydro-D-glucitol.

61. (New) The method of claim 58, wherein the non-metabolizable sugar is 3-O-methyl-glucose (3OMG).

62. (New) The method of claim 58, wherein the desired intracellular concentration of non-metabolizable sugar is less than or equal to about 1.0 M.

63. (New) The method of claim 58, wherein the desired intracellular concentration of non-metabolizable sugar is less than or equal to about 0.4 M.

64. (New) The method of claim 58, wherein the desired intracellular concentration of non-metabolizable sugar is less than or equal to about 0.2 M.